FIRST AUXILIARY REQUEST

Claims

1. A refrigerant composition which comprises:

   (i) pentafluoroethane, 1,1,1,2- ~~or 1,1,2,2-~~tetrafluoroethane, ~~1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane,~~ or a mixture ~~of two or more~~ thereof, in an amount from 30 to 50% by weight based on the weight of the composition
   (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is ~~at least~~ 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition.

   with the remainder, not exceeding 60% by weight based on the weight of the compostion, being:

   (iii) pentafluoroethane, ~~trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof~~.

2. A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.

3. A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

4. A refrigerant composition which comprises:

   (i) pentafluoroethane, 1,1,1,2- ~~or 1,1,2,2-~~tetrafluoroethane, ~~1,1-difluoroethane, trifluoromethoxypentafluoroethane, 1,1,1,2,3,3,3-heptafluoropropane or 1,1,1,2,2,3,3-heptafluoropropane,~~ or a mixture ~~of two or more~~ thereof, in an amount from 50 to 75% by weight based on the weight of the composition
   (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is ~~at least~~ 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition; with the remainder being
   (iii) pentafluorethane, ~~trifluoromethoxydifluoromethane or hexafluorocyclopropane, or a mixture of two or more thereof.~~

5. A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

~~6. A composition according to claim 4 or 5 wherein component (iii) is pentafluoroethane.~~

~~7. A refrigerant composition which comprises:~~

   ~~(i) 1,1,1,2- or 1,1,2,2-tetrafluoroethane, or a mixture of pentafluoroethane and 1,1,1,2- or 1,1,2,2- tetrafluoroethane,~~ in an amount from 30 to 94% by weight based on the weight of the composition,
   (ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is at least and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,
   (iii) pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition with the proviso that the concentration of pentafluoro-ethane in the composition is not 5 to 20% by weight based on

~~the weight of the composition.~~

6 ~~8~~. A composition according to any one of the preceding claims wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.

7 ~~9~~. A composition according to claim 6 ~~8~~ wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.

8 ~~10~~. A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.

~~11. A composition according to any one of the preceding claims wherein component (ii) comprises a hydrocarbon which possesses 4 or 6 carbon atoms.~~

9 ~~12~~. A composition according to ~~claim 11~~ any of the preceding claims wherein component (ii) comprises a hydrocarbon which is n-butane.

10 ~~13~~. A composition according to claim 9 ~~12~~ which comprises:

(a) 46 to 46.5% by weight of pentafluoroethane
(b) 50 % by weight of 1,1,1,2-tetrafluoroethane and
(c) 4 to 3.5% by weight, respectively, of n-butane.

11 ~~14~~. Use as a refrigerant of a composition as claimed in any one of claims 1 to 10 ~~13~~.

12 ~~15~~. Use according to claim 11 ~~14~~ in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.

~~16. Use of a refrigeration composition which comprises:~~

~~(i) pentafluoroethane, 1,1,1,2- or 1,1,2,2-tetrafluoroethane, 1,1-difluoroethane, 1,1,1,2,3,3,3-heptafluoropropane~~ or 1,1,1,2,2,3,3,-heptafluoropropane, or a mixture of two or more thereof, in an amount ~~from~~ 30 to 94% by weight based on the weight of the composition and
(ii) an unsubstituted hydrocarbon of the formula C_nH_m ~~in which n~~ is at least 4 and m is at least 2n-2, other than methyl propane, in an amount from 1 to ~~10% by weight~~ based on the weight of the composition, as a replacement for chlorodifluoromethane.
(iii) pentafluoroethane in an amount from 5 to 60% by weight based on the weight of the composition, as a ~~replacement for chlorodifluoromethane.~~

~~17. Use according to claim 16 wherein the composition is as defined in claim 13.~~

13 ~~18~~. The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to 10 ~~15~~ in the vicinity of a body to be cooled.

14 ~~19~~. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one of claims 1 to 10 ~~13~~.

15 ~~20~~. A refrigeration apparatus according to claim 14 ~~18~~ which is designed to use chlorodifluoromethane as refrigerant.

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FIRST AUXILIARY REQUEST

Claims

1. A refrigerant composition which comprises:

(i) pentafluoroethane, 1,1,1,2-tetrafluoroethane, or a mixture thereof, in an amount from 30 to 50% by weight based on the weight of the composition,

(ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is 4 or 5 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,

with the remainder, not exceeding 60% by weight based on the weight of the composition, being:

(iii) pentafluoroethane.

2. A composition according to claim 1 wherein component (i) is present in an amount of 50% by weight based on the weight of the composition.

3. A composition according to claim 1 or 2 wherein component (i) is 1,1,1,2-tetrafluoroethane or a mixture of said ethane with pentafluoroethane.

4. A refrigerant composition which comprises:

(i) pentafluoroethane, 1,1,1,2-tetrafluoroethane, or a mixture thereof, in an amount from 50 to 75% by weight based on the weight of the composition,

(ii) an unsubstituted hydrocarbon of the formula C_nH_m in which n is 4 or 5 and m is at least 2n-2, other than methyl propane, in an amount from 1 to 4% by weight based on the weight of the composition,

with the remainder being:

(iii) pentafluorethane.

5. A composition according to claim 4 wherein component (i) is 1,1,1,2-tetrafluoroethane or

a mixture of said ethane with pentafluoroethane.

6. A composition according to any one of the preceding claims wherein component (ii) is present in an amount from 2 to 4% by weight based on the weight of the composition.

7. A composition according to claim 6 wherein component (ii) is present in an amount from 3 to 4% by weight based on the weight of the composition.

8. A composition according to any one of the preceding claims wherein component (ii) is a mixture of said hydrocarbons.

9. A composition according to any of the preceding claims wherein component (ii) comprises a hydrocarbon which is n-butane.

10. A composition according to claim 9 which comprises:

(a) 46 to 46.5% by weight of pentafluoroethane,

(b) 50% by weight of 1,1,1,2-tetrafluoroethane and

(c) 4 to 3.5% by weight, respectively, of n-butane.

11. Use as a refrigerant of a composition as claimed in any one of claims 1 to 10.

12. Use according to claim 11 in a refrigeration or airconditioning system designed to use chlorodifluoromethane as refrigerant.

13. The process for producing refrigeration which comprises evaporating a composition as claimed in any one of claims 1 to 10 in the vicinity of a body to be cooled.

14. A refrigeration apparatus containing, as refrigerant, a composition as claimed in any one of claims 1 to 10.

15. A refrigeration apparatus according to claim 14 which is designed to use chlorodifluoromethane as refrigerant.